In the Claims

Please cancel without prejudice Claims 20-37.

Please add new Claims 38-68.

38. (New) A method of forming a phase-shift mask employing photomask topography and photoresist sensitivity to electromagnetic radiation comprising:

providing a plane wave from an electromagnetic beam source incident on a mask, the mask adapted to selectively phase-shift at least a portion of the beam according to a predetermined pattern to produce a phase-shifted beam;

passing the beam from the electromagnetic plane wave through the mask to create a phase-shifted beam having a diffraction pattern;

approximating, in a frequency domain, the phase and amplitude via a Fourier transform at a lens pupil plane;

directing the diffraction pattern at a substrate to form an image via interference, the substrate adapted to selectively change dissolution characteristics of a photo-imageable material and avoiding unwanted artifacts such that intended features develop; and

transferring, via a fabrication process, the pattern onto a substrate.

39. (New) The method of claim 38 wherein the approximating further comprises a sinc function.

40. (New) The method of claim 38 wherein the fabrication technique includes etching, ion implanting, and lift off.

41. (New) The method of claim 38 wherein passing the beam through the mask further comprises determining a transmittance of the mask.

42. (New) The method of claim 38 wherein the phase-shifted beam comprises a plurality of beam portions.

43. (New) The method of claim 42 wherein the beam portions further comprise a plurality of interfering beam portions in the pupil plane.

44. (New) The method of claim 43 wherein the interfering beam portions include at least a first beam portion and a second beam portion.

45. (New) The method of claim 44 wherein the first beam portion corresponds to at least one primary feature and the second beam portion corresponds to at least one assist feature.

46. (New) The method of claim 44 wherein the first beam portion and the second beam portion are at unequal phases.

47. (New) The method of claim 44 wherein the first beam portion is substantially an odd multiple of 180 degrees out of phase from the second beam portion.

A1 cont. 48. (New) The method of claim 38 wherein the phase-shift is a strong phase-shift.

49. (New) The method of claim 48 wherein the strong phase-shift substantially eliminates zero-frequency light between the first beam portion and the second beam portion.

50. (New) The method of claim 48 wherein the strong phase-shift is operable to balance opposing electric fields between the first beam portion and the second beam portion.

51. (New) The method of claim 38 wherein passing the beam further comprises off-axis illumination by determining an optimal zero-frequency amplitude and phase.

52. (New) The method of claim 48 wherein the approximating further comprises rigorous analyzing for a design rule check of the strong phase shift in the Fourier plane.

53. (New) The method of claim 38 wherein the phase-shift is a weak phase shift.

54. (New) The method of claim 38 wherein the approximating further comprises rigorous analyzing for a physical rule check of the strong phase shift in the pupil plane.

55. (New) The method of claim 50 wherein the balanced electric field at the zero-frequency corresponds to the amplitude of a plurality of objects on the mask.

56. (New) The method of claim 38 wherein the approximating further comprises simulating on a computer.

57. (New) The method of claim 56 wherein the computer further comprises a plurality of computers in parallel.

58. (New) The method of claim 45 wherein the primary feature is an isolated feature on the mask.

A1 cont.

59. (New) The method of claim 45 further comprising forming the assist feature by a subtractive etch process.

60. (New) The method of claim 45 further comprising forming the primary feature by a subtractive etch process.

61. (New) The method of claim 45 further comprising forming the assist feature by an additive process.

62. (New) The method of claim 45 further comprising forming the primary feature by an additive process.